

WHAT IS CLAIMED IS:

1. A film-forming method for forming a deposited film on a substrate arranged in a substantially enclosed film-forming vessel by means of plasma CVD, said film-forming vessel being provided with a raw material gas introduction means and an exhaustion means, said film-forming method comprising the steps of introducing a raw material gas comprising at least a hydrogen gas and a silicon-containing raw material gas into said film-forming vessel through said raw material gas introduction means, maintaining an inner pressure of said film-forming at a desired value by means of said exhaustion means and introducing a high frequency power into said film-forming vessel through a discharge electrode provided in said film-forming vessel to generate a plasma in a plasma generation region between said substrate and said discharge electrode in said film-forming vessel whereby forming said deposited film on said substrate maintained at a desired temperature, characterized in that the formation of said deposited film on said substrate is performed while applying a periodicity voltage having at least two different waveform components having a different amplitude to an auxiliary electrode arranged at a position in said plasma generation region of said film-forming vessel.

2. The film-forming method according to claim 1, wherein the periodicity voltage has (i) a waveform component having an amplitude capable of generating mainly a radical of a silicon-containing compound and
5 (ii) a waveform component having an amplitude capable of forming mainly a radical of hydrogen.

3. The film-forming method according to claim 1 or 2, wherein the discharge electrode is arranged such that said discharge electrode is opposed to a film-forming
10 surface of the substrate and is situated at a position between the substrate and the discharge electrode.

4. The film-forming method according to claim 1, wherein the auxiliary electrode is arranged to be in parallel to the substrate and perpendicular to a flowing
15 direction of the raw material gas which flows from the raw material introduction means toward the exhaustion means in the film-forming vessel.

5. A film-forming method for forming a deposited film on a substrate arranged in a substantially enclosed
20 film-forming vessel by means of plasma CVD, said film-forming vessel being provided with a raw material gas introduction means and an exhaustion means, said film-forming method comprising the steps of introducing a raw material gas comprising at least a hydrogen gas and
25 a silicon-containing raw material gas into said

film-forming vessel through said raw material gas introduction means, maintaining an inner pressure of said film-forming vessel at a desired value by means of said exhaustion means and introducing a high frequency power
5 into said film-forming vessel through a discharge electrode provided in said film-forming vessel to generate a plasma in a plasma generation region between said substrate and said discharge electrode in said film-forming vessel whereby forming said deposited film on said
10 substrate maintained at a desired temperature, characterized in that said substrate is retained in a state of having a floating potential in said film-forming vessel, an auxiliary electrode is provided on a side opposite a film-forming face of said substrate in said
15 film-forming vessel such that said auxiliary electrode is electrically isolated from said substrate, and the formation of said deposited film on said substrate is performed while applying a periodicity voltage having at least two different waveform components having a
20 different amplitude to said auxiliary electrode.

6. The film-forming method according to claim 5, wherein the periodicity voltage has (i) a waveform component having an amplitude capable of generating mainly a radical of a silicon-containing compound and
25 (ii) a waveform component having an amplitude capable of

generating mainly a radical of hydrogen.

7. The film-forming method according to claim 5 or 6, wherein the auxiliary electrode is arranged so that even when a conductive deposited is formed on the substrate, said conductive deposited film has a potential capable of being maintained at a floating potential.

8. The film-forming method according to claim 5 or 6, wherein the auxiliary electrode is arranged such that said auxiliary electrode is in parallel to the substrate and is perpendicular to a flowing direction the raw material gas which flows from the raw material gas introduction means toward the exhaustion means in the film-forming vessel.